SUPPORT FOR THE AMENDMENT

This Amendment cancels Claim 16; and amends Claim 1. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 1 is found in canceled Claim 16. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1 and 14-15 and 17-24 will be pending in this application. Claim 1 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing, and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The present invention is related to a particle-dispersed complex in which fine ruthenium particles are dispersed in a carbon matrix. The complex can serve as a very active electrochemical catalyst used as the sensor electrode of a solid electrolyte sensor or as the electrode of an electrochemical device. Specification at [0001], abstract.

Claims 1, 15-17 and 22 are rejected under 35 U.S.C. 102(b) over U.S. Patent Application Publication No. US 2003/0026921 ("Ueno") with evidence from U.S. Patent Application Publication No. US 2004/0129202 ("Gruen") and "Ru-Doped Nanostructured Carbon Films" *Diamond and Related Materials* 11 page 1890-1896 (2002)("Lian").

Claim 14 is rejected under 35 U.S.C. 103(a) over Ueno and further with evidence from Lian.

Claims 18-21 and 23-24 are rejected under 35 U.S.C. 103(a) over Ueno and further in view of "Electrochemical Properties of Iridium-Carbon Nano Composite Films Prepared by MOCVD", *Scripta Materialia* 44, 1187-1190 (2001)("Goto") with evidence from U.S. Patent No. 5,814,719 ("Suzuki").

Ueno discloses a method for synthesizing "metal-doped amorphous (diamond-like) carbon films" using plasma assisted decomposition of metalorganic precursors. Ueno at [0009]. More particularly, a metalorganic precursor for the desired diamond-like carbon film is treated by an electron cyclotron resonance (ECR) chemical vapor deposition (CVD) technique to form a film on a substrate. Ueno at [0010].

However, Ueno is silent about the independent Claim 1 limitations of "metallic ruthenium particles dispersed in and surrounded by the matrix, wherein ... the matrix is carbon black".

The secondary references fail to remedy the deficiencies of Ueno.

Gruen discloses microelectromechanical systems (MEMS) structures fabricated from ultrananocrystalline diamond films deposited by a chemical vapor deposition (CVD) method. Gruen at abstract; [0002]; [0034].

Lian discloses pure and Ru-doped carbon films are deposited on Si (100) substrates by electron cyclotron resonance chemical vapor deposition. Lian at abstract. Lian discloses that in both the pure and Ru-doped samples, diamond nanocrystallites are formed in amorphous carbon matrices. Lian at abstract.

The Final Rejection notes at page 3, lines 20, that "LIAN teaches the production of a diamond like carbon film" and at page 4, lines 3-4, that "GRUEN teaches that a diamond-like carbon film having diamond nanocrytals of about 3 to 5 nm in size is non-porous".

The Final Rejection cites Gruen and Lian against independent Claim 1 as "evidence that the ruthenium encapsulated film of Ueno would be non-porous, i.e. that the metallic ruthenium particles inside the carbon matrix would be completely encapsulated by either the carbon matrix or other ruthenium particles as claimed". Final Rejection at page 3, lines 16-19.

The Final Rejection at page 6, lines 3-14, cites Lian in support of Ueno against dependent Claim 14 for suggesting an atomic number ratio of carbon to ruthenium in the particle dispersed complex.

The Final Rejection at pages 7-8 cites Goto in support of Ueno against dependent Claims 18-21 and 23-24 for suggesting a solid electrolyte substrate.

The Final Rejection cites Suzuki as evidence that "it is well known in the art and common to use noble metals such as platinum, palladium, iridium and ruthenium interchangeably as catalytic materials for incorporation into solid electrolye sensors. Final Rejection at page 7, lines 13-16.

However, the second references fail to suggest the independent Claim 1 limitations of "metallic ruthenium particles dispersed in and surrounded by the matrix, wherein ... the matrix is carbon black".

The matrix of Lian's film is formed of diamond nanocrystallites (diamond-like carbon, DLC).

Here, the DLC or the diamond nanocrystallites are believed to be insulators.

However, it is believed that fine particles of Ru, which are conductive, are dispersed in the matrix to thereby make the entire matrix conductive (semi-conductive).

In contrast, the matrix, per se, is conductive in the present invention ([0033]), and, specifically, the matrix is formed of carbon black (Claim 1, [0033], [0056]). The specification at [0032] contains the following description, which implies that the matrix, like each of the metallic ruthenium particles, is conductive.

> It is preferred that the entire surface of the fine particles makes contact with at least either the matrix or the fine particles, namely, there are almost no or absolutely no holes or gaps in the interface between the fine particles and the matrix. By the bonding between the fine particles and the matrix on the entire surface of the interface thereof, and in combination with the fact that the particle diameter of the dispersed fine particles is small, the interfacial surface area making contact becomes very large, and as a result, the particle-dispersed complex is believed to obtain a **high interfacial electrical conductivity**. Further, as for the dispersion state in the matrix of the particle-dispersed complex, it is preferred that there is uniformly dispersing without aggregation. Namely, it is more preferred that the entire surface of the fine particles makes contact with only the matrix. This is because the interfacial surface area in which the matrix makes contact becomes large. Specification at [0032] (emphasis added).

Thus, in the present invention the matrix is carbon black and has conductivity.

In contrast, Ueno's DLC, Gruen's ultrananocrystalline diamond, and Lian's diamond nanocrystallites, per se, are insulators.

Thus, the cited prior art fails to suggest the independent Claim 1 limitations of a "particle-dispersed complex, comprising a matrix having carbon as a main component; and **metallic ruthenium particles** dispersed in and surrounded by the **matrix**, wherein ... every part of the entire surface of each of the particles makes contact with either the matrix or another of the particles; and the **matrix is carbon black**".

Therefore, the prior art rejections should be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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